87331 Kork Order ID 87331 Page 1 213-12 1:09:57 PM Accept *N900040100* D350-748-101 Îtem ID: Setup Start Revision ID: WK Crosstube Installation, High Fwd Item Name: 7/10/12 Start Qty: 1.00 **Cust Item ID: Start Date:** Req'd Qty: 1.00 Required Date: 9/28/12 Customer: Reference: Run Process Plan: MLJ Date: 12/07 Tooling: Date: Approvals: Stop Date: SPC (Y/N): Date: **Tool ID** Tool # Plan Reject Reject Insp. Sequence ID/ Operation Set Up/ Accept Qty Oty Number Stamp Work Center ID Description **Run Hours** Code Draw Nbr **Revision Nbr** FYR OK 4/12/7/16 D350-748-141 0.00 100 DOCUMENT CONTROL *100* 0.00 DC Memo CHG002 12 11-06 Photocopy bluefile & type labels per PPPD350-748-101 Document Control 0.00110 BENDING MACHINE - CROSSTUBES *110* 0.00 CNC Bend 1 Memo Bend tube as per Dwg D350-748-141 using CNC bender program D350F and CNC Delta 100 Bender ****UNDER BEND .225" PER SIDE**** Crosstube Dimensional Check 0.00 120 *120* 0.00 Quality Control

							•				DQA:	Date:	- r - r - r - r - r - r - r - r - r - r		
NCR:	Yes	/ No					WORK ORDER NON-C	O	NFORM	MANCE / UPDATE			10 yes 21 di		
											QA Closed:	Date:	·		
Nork Ord	er:						DISPOSITION			AGAINST DEPARTMENT/PROCESS					
Part No							Scrap Machini Use-as-is Thermoform			Skid-tube Crosstube Machining Small Fab noforming Finishing Large Fab Composite		Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other		
Root		,			Des	crip	otion of work order update	١	nitial	Action	Sign &				
Cause		Date	Step	Qty		C	r Non-conformance	Ch	ief Eng	Description	Date	Verification	QC Inspector		
oc/Data quip/Tooling perator faterial etup ther rocess upplier raining napproved		ý	·				À.								
								AUL	T CATE	GORY					
Landi	-	Bending Centre No Cracks Crushed/G Cuffs Heat Trea Inspection Ripples in Torque W	Crimped. t n Strip in Bend 'aves in E	Tube	÷		General Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short Drill Holes Drawing		Instruct Mainte Mislabe Misread Offset Out of (ion Incomplete ions Incomplete/Unclear enance eled d	Ovalized Over/Under Part Incorre Part Lost/M Part Moved Positioned V Power Loss/	ct sissing Vrong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other		
		Turning S			Finish		Out of 9	Sequence							

Outside Dimensions

Wave/Twist in Tube

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Page 2

July-13-12 1:0				۸/.	5.5 i				1 uge 2
Item ID: Revision ID:	D350-748-1 U/R	01	7	Accept	*N90004	0100 *	Setup	Start	*NS1*
Item Name:		tallation, High Fwd						Stop	*NS2*
Start Date:	7/10/12	Start Qty: 1.00	*1*		_ Cust Item ID:				
Required Date	e: 9/28/12	Req'd Qty: 1.00	*1*		Customer:				
Reference:			-					C44	
Approvals:	Process Pla	an:	Date:	Tooling: _	Date:		Run	Start	*NR1*
	QC:	**	_ Date:	SPC (Y/N):	Date:	-	·	Stop	*NR2*
Sequence ID/ Work Center	ID (4)	Operation Description		Set Up/ \$\frac{1}{2}\frac{1}{2}	Tool ID Tool	# Plan Acc Code Qty	-		Reject Insp. Number Stamp
125	•	. 2		0.00			. (^		
125 HandFXtube		(Memo		0.00		(L	2/10/	02 (1)
Hand Finishing Co	rosstubes	***Stress re Heat treat c Temp: Start time: Finish time	rosstube as per QSI010 4.	3 P.D. 1800	26 tour		/El.		30
127 *127* QC		QCG- Inspect dimension	s to drawing	0.00	12/10/08				?/o→
Quality Control					· · · · · · · · · · · · · · · · · · ·	10 .			
		V							

XTC

NCR:	Yes /	No.
INCh.	162 /	3110

4 1		
<i>1</i> //	. /	
DQA: Date: 12(1)10	•	
DUANTO Date. Willio	1 2	2
\frac{1}{1}		
	* *	

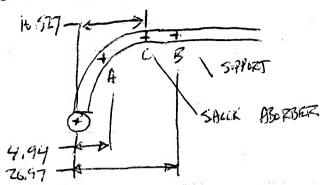
NCR: Y	es / No				WORK ORDER NON-O	CONFOR	QA Closed:	Date:			
Work Orde Part N NCR N	r: 8° o. D3Sc o. 12°	733 174 101		ol	, DISPOSITION Rework Scrap Use-as-is Work Order Update	-4	Skid-tube Machining moforming Large Fab	AGAINST D Crosstube Small Fab Finishing Composite	DEPARTMENT/PROCESS Water Jet Engineering Quality Prod. Eng. Coor. Quality Rec/Store/Packaging Other Supplier		
Root					ption of work order update	Initial	l .	ction	Sign &		
Cause	Date	Step	Qty	•	or Non-conformance	Chief Eng	Desc	cription	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material	12/194	110	1	Tube toleran	(c.	0As 12 12/149	Acceptable	per S.R.	12/144	(0.4°	0.46
Other Process Supplier			٠		•					Migha	119/2
raining]										
Jnapproved					35						
					F.	AULT CATE	GORY				
_	g Gear			_	General	:A.		_	_		_
	X Bending Centre Not Concentric to O/S Cracks X Crushed/Crimped.				Bend BOM/Route Broken/Damaged Burrs	Hardwa	Gram Hardware Inspection Incomplete Instructions Incomplete/Unclear		Ovalized Pressure/Forced Over/Under tolerance Temperature/Cu Part Incorrect Weld Part Lost/Missing Wrong Stock Pul		
	Cuffs				Contamination	Mainte	enance		Part Moved		
	Heat Treat				Countersink	Mislab	eled		Positioned V	Wrong	_
<u></u>	Inspection Strip in Tube				Cut Too Short	Misrea	d		Power Loss/	'Surge	Other
	Ripples in Bend				Drill Holes	Offset					
Torque Waves in Extrusion				n L	Drawing	Out of Calibration					
I	Turning S	equence			Finish	Out of	Out of Sequence				

Outside Dimensions

Wave/Twist in Tube

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

CRUSHING OF D350-748-101



POINT B UD = 2.339 ID = 2.000

POINT B UD = 2.339 ID = 2.000

SECTION T = 0.684 in 4

AB F=ML/I = Pn4.94 × 2.044/2×0.361 = 13.98 P B3 = Pn26.97 × 2.339 /2 = 0.684 = 46.11 P

M.S. = 46.11/13.98-1 = 2.30

Es Tobe will fail out suppost before tube fails out avec of max crushing so 8% CRUSTING 15
Acceptable

FORT C IZ 0.684 IN 9 FIMILIT > PUNSSAM PAIG SZ7 V 2.379/2×0.684 2 28.26.P

MS= 28.26/3,98-1 = 1.02

of most constant on Bill crushing is acceptable

If 12, 64, 19



	D350-748-101 U/R	~	٠	Accept	*N900	<u> </u>) ()* s	etup Start	*NS1*
	Crosstube Installation, l	High Fwd						Stop	*NS2*
Start Date: Required Date:		Qty: 1.00 Qty: 1.00	*1* *1*	-4	Cust Item Customer:		**************************************		
Reference:			•		5			un Start	
Approvals:	Process Plan:		Date:	Tooling: SPC (Y/N):		Oate:	K	un Start Stop	*NR1* *ND2*
Sequence ID/ Work Center II 130 *130* Crosstubes	Opera	ption : pes		Set Up/ Run Hours 0.00	Tool ID	Tool# Plan	le Qty	Qty 1	Reject Insp. Number Stamp
Crosstubes		Set-up drill 2-Deburr 3-Engrave Pat 4-Remove all	table as per QSI 010	Dwg D350-748-141	» Rm	KM/MO	12-10 -10	9 - 9	
140 *140* QC Quality Control	QC5- In	Memo	neness to step on W/O	0.00 AS 0.00 16 58876E (EUROCOPTER CL.	MP)		. ,		,

										DQA:	Date:	
NCR:	/es	/ No				WORK ORDER NON-	COI	VFOR	MANCE / UPDATE			35
										QA Closed:	Date:	
Work Ord	er:		,			DISPOSITION			AGAINST	DEPARTMENT	/PROCESS	-
	Part No. Scra Use-as							1	Skid-tube Crosstube Machining Small Fab noforming Finishing		Water Jet d. Eng. Coor. re/Packaging	Engineering Quality Other
NCR No.						Work Order Update		mem	Large Fab Composite	Rec/sto	Supplier	Other
Root			;		Desci	ription of work order update		Initial	Action	Sign &		
Cause		Date	Step	Qty		or Non-conformance	Ch	ief Eng	Description	Date	Verification	QC Inspector
oc/Data												
quip/Tooling												
perator												
/laterial												
etup		_										
Other												
rocess												-
upplier			5.0									
raining	- 37											
Inapproved	L_	İ										
			***				FAUL	T CATE	GORY			
Landi	ng (1			_	General		1				l
	<u> </u>	Bending	_		-	Bend	\vdash	Grain		Ovalized	. –	Pressure/Forced
	-	Centre No	ot Concer	ntric to (^{O/S} -	BOM/Route	-	Hardwa		Over/Under	⊢	Temperature/Cure
						Broken/Damaged		1	ion Incomplete	Part Incorre	<u> </u>	Weld
	Crushed/Crimped. Burr							1	tions Incomplete/Unclear	Part Lost/M	_	Wrong Stock Pulled
	Cuffs					Contamination	<u> </u>	Mainte		Part Moved		
	_	Heat Trea	-		-	Countersink	\vdash	Mislabe		Positioned \		٦
	Inspection Strip in Tube					Cut Too Short	_	Misread	d	Power Loss	/Surge	Other
						Drill Holes		Offset				
	L	Torque W	aves in E	xtrusio	n L	Drawing	<u></u>	Out of (Calibration			
		Turning So	equence			Finish		Out of 9	Sequence			

Outside Dimensions

Wave/Twist in Tube

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Page 4

July-13-12 1:09:57 PM

tem ID:	D350-748-10)1		Accept	*N90	0040	100)* s	etup Star	t *N;	S1*	
Revision ID: tem Name:	U/R Crosstube Insta	allation, High Fwd							Stop	*N	S2*	
Start Date:	7/10/12	Start Qty: 1.00	*1*		Cust Iter							
Required Date Reference:	: 9/28/12	Req'd Qty: 1.00	*1*		Custome				Q .			
Approvals:	Process Pla	n:	Date:	Tooling:		Date:		F	tun Star Stoj	"17	R1*	
	QC:		Date:	_ SPC (Y/N):		Date:		ě,	5101	*N	R2*	
Sequence ID/ Work Center 1	ID	Operation Description		Set Up/ Run Hours	Tool II	Tool#	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp	
150		Outsource process-Cadp	late per QSI017 4.1.9.1	0.00				ر ا	D	0		
150 Outsource3 Outsource process	- Cad plate	Magnetic P Cadium Pla Embrittle re Possibe Sup	at 375° for 5 hours article Inspect per ASTM te per AMS-QQ-P-416B, of lief at 375° for 8 hours, Cl plier: Southwest United In ificate of Conformity is at	Class 1, Type 2 hromate Treat adustries	(8)			<u>Co</u>	- 12	<u>))0/11</u>	_(1)_	
160		Receive & Inspect for D	amage & Mat'l Certs	0.00						11		
160 Packaging Packaging		Memo Ensure cert	ificate of conformity is att	/	ENSUNE NO	TOPP		46)	141	11/3°	O -)
				(次5段	W/S CHA	HITHCH E	y s	sigo.	76		/	
170 + 4 7 0 +		QC5- Inspect part comp	leteness to step on W/O	0.00				DA	S	2 11.0	4	
170 ^{QC}		Memo		0.00				S-8	•	~ II.	9	
Quality Control												

NCR: Y	es /	Nο

												DQA	:Date	2:	
NCR: Y	es	/ No					WORK ORDER NON-C	O	NFORM	MANCE / UPI	DATE		·		· · ·
							,			<u>, </u>		QA Closed	: Date	2:	
Vork Orde	r.					I	DISPOSITION	AGAINST DEP				EPARTMEN	/PROCESS		
VOIR OIGE	' -					١	Rework	Rework Skid-tube			Crosstube		Water Jet	7	Engineering
Part N	lo.					۱	Scrap			Machining	Small Fab	Pro	od. Eng. Coor.	┨ `	Quality
							Use-as-is		Thern	noforming	Finishing	Rec/Sto	re/Packaging	7	Other
NCR No.							Work Order Update			Large Fab	Composite		Supplier		
												T a: 0	7		
1 1 1							tion of work order update	ļ	nitial	Act		Sign &) / a wifi a a bi a w		061
Cause	\dashv	Date	Step	Qty		0	r Non-conformance	Cn	ief Eng	Descr	ription	Date	Verification	+	QC Inspector
oc/Data	\dashv														
quip/Tooling perator	\dashv														
laterial	\dashv														
etup	\dashv	**													
ther	ヿ									:					
rocess	┨		٠												
upplier	╗													İ	
raining															
napproved															
							FA	4UL	T CATE	GORY					
Landir	ng G	ear			_	_	General				_		_		
,		Bending			L		Bend		Grain			Ovalized		Pr	ressure/Forced
1	— 1	Centre No	t Concer	ntric to	o/s	-	BOM/Route	_	Hardwa	re		Over/Unde	r tolerance	1	emperature/Cure
ļ	—;	Cracks	i.		_		Broken/Damaged	<u>L</u>	1	on Incomplete		Part Incorr	-	_	Veld
ļ	\neg	Crushed/C	Crimped.		L	-	Burrs	<u> </u>	1	ions Incomplete/l	Jnclear	Part Lost/N	· L	\w	Vrong Stock Pulled
}	Cuffs						Contamination	<u> </u>	Mainte		L	Part Move			
	Heat Treat						Countersink	L	Mislabe	led	L	Positioned	Wrong		
1	Inspection Strip in Tube						Cut Too Short	L	Misread	I	L	Power Loss	/Surge	0	ther
	Ripples in Bend					-4	Drill Holes		Offset						
Ţ	Torque Waves in Extrusion					1	Drawing	<u></u>	4	Calibration					
1	Turning Sequence F					_	Finish	Out of Sequence							
0,0	Wave/Twist in Tube					1	Folio		Outside	Dimensions					

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DQA: Date: **WORK ORDER NON-CONFORMANCE / UPDATE** NCR: Yes / No QA Closed: Date: Work Order: \$7331 DISPOSITION **AGAINST DEPARTMENT/PROCESS** Rework Skid-tube Crosstube Water Jet Engineering Part No. \$\overline{D}\$50-748-101 Small Fab Prod. Eng. Coor. Quality Machining Scrap Rec/Store/Packaging Other Thermoforming Finishing Use-as-is Work Order Update Supplier Large Fab Composite NCR No. This was only Description of work order update Action Sign & Initial Root Date Verification QC Inspector or Non-conformance Chief Eng Description Cause Date Step Qty Doc/Data 12/7/16 LOPP THAT THE TO THIS P Equip/Tooling FOR MINITE Operator Material Setup See page 6
12/7/15 See 1749
PAU = 176 NOT TUBE Other Process Supplier Training Unapproved **FAULT CATEGORY** General **Landing Gear** Pressure/Forced Ovalized Bend Grain Bending Over/Under tolerance Temperature/Cure BOM/Route Centre Not Concentric to O/S Hardware Weld Part Incorrect Broken/Damaged Inspection Incomplete Cracks Wrong Stock Pulled Instructions Incomplete/Unclear Part Lost/Missing Crushed/Crimped Burrs Maintenance Part Moved Cuffs Contamination Mislabeled Positioned Wrong Countersink Heat Treat Other Power Loss/Surge Misread Inspection Strip in Tube Cut Too Short

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Torque Waves in Extrusion

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Drill Holes

Drawing

Finish

87331

Page 5

July-13-12 1:09:57 PM D350-748-101 Accept Item ID: *N900040100* Setup Start **Revision ID:** U/R Crosstube Installation, High Fwd Item Name: *1* **Start Date:** 7/10/12 Start Qty: 1.00 **Cust Item ID:** Required Date: 9/28/12 **Req'd Qty:** 1.00 **Customer:** Reference: Run Process Plan: ____ Date: ____ Tooling: Date: **Approvals:** Stop QC: _____ Date: ____ SPC (Y/N): Date: Tool ID Tool # Plan Reject Reject Insp. Sequence ID/ Operation Set Up/ Accept **Qty** Number Stamp Work Center ID Description Run Hours Code Qty 180 0.00 SprayPaint 1 0 0 *120* 0.00 SprayPaint 1-Prime inside crosstube as per QSI 005 4.2 122 888/T10:00-10:45
2-Prime Outside of Tube as per Dart QSI 005 4.2 123307/T3:00-3:45 **Spray Painting** 0.00 190 QC14- Inspect Spray Paint DAS 12-11-04 *190* 0.00 OC Memo Quality Control Then, Wrap in plastic bag to protect from scratches 0.00 200 12-11-4 Crosstubes *200* 0.00 Crosstubes Memo Crosstubes 1-Install Ground wire Insert, then insert screw and washer 2-Install Abraision strips as per Dwg D350-748-141 & QSI 035. 3-Install supports Using Dt8876 as per Dwg D350-748-141, Torque to 60-80 IN-

											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-	COI	NFORM	MANCE / UP	DATE			
									·		QA Closed:	Date:	
Work Ord	or:					DISPOSITION							
WOIK OIG	CI.					Rework	7	Skid-tube Crosstube]	Water Jet	Engineering
Part No.						Scrap		ſ	Machining	Small Fab	4	d. Eng. Coor.	Quality
NCR No.						Use-as-is Thermoforming Finishing Work Order Update Large Fab Composite			Rec/Sto	re/Packaging Supplier	Other		
Root					Descri	ption of work order update		Initial	Ac	tion	Sign &		
Cause		Date	Step	Qty	(or Non-conformance	Ch	nief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data						•							
Equip/Tooling													
Operator													
Material							ĺ						
Setup									1 -				
Other							1						
Process													
Supplier]				•							
Training													
Unapproved													
						F	AUI	T CATE	GORY				
Landi	ng (Gear				General		_			_		_
Bending						Bend		Grain			Ovalized		Pressure/Forced
	Centre Not Concentric to O/S					BOM/Route] Hardwa	re		Over/Under	tolerance	Temperature/Cure
Cracks						Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld
Crushed/Crimped.				Burrs		Instruct	ions Incomplete	/Unclear	Part Lost/M	issing	Wrong Stock Pulled		
		Cuffs				Contamination		Mainte	nance		Part Moved		-
		Heat Trea	it			Countersink		Mislabe	eled		Positioned \	Nrong	
	Inspection Strip in Tube					Cut Too Short		Misread			Power Loss,	/Surge	Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Work Orde July-13-12 1:09		7331		*873	31*							Page 6
Item ID: Revision ID: Item Name:	D350-748- U/R . Crosstube Ir	101 nstallation, High Fwd		Accept	*N900	040	100)* s	etup	Start Stop	1.71	S1* S2*
	7/10/12 9/28/12	Start Qty: 1.00 Req'd Qty: 1.00	*1* *1*		Cust Item I Customer:	D:						() /
Approvals:		'lan:		Tooling: SPC (Y/N):		ate:		R	Run	Start Stop	*N *N	R1* R2*
Sequence ID/ Work Center II 210 *21 \cdot* QC Quality Control	D	Operation Description QC5- Inspect part compl	eteness to step on W/O	Set Up/ Run Hours 0.00	Tool ID	Tool#	Plan Code	Accept Qty DAS 11 &89	Qty	y I	Reject Number	Insp. Stamp
220 *220* Packaging Packaging		Pick Kit Memo		0.00				/X	1	-a 1880		SP -//-(
230		QC4- 100% Inspect kits	for completeness	0.00 AC	i,			١				

Seg 172 Web 1550 to PO 18302 LPI as per ASHM 1417 Level 2

Memo

230

Quality Control

Ma-11-01

												DQA:	Date:	
NCR: \	'es	/ No					WORK ORDER NON-C	100	NFORM	/IANCE / UPI	DATE	•		• • • •
							· · · · · · · · · · · · · · · · · · ·		<i>-</i>			QA Closed:	Date:	
Vork Orde	ar.						DISPOSITION				AGAINST DE	PARTMENT	PROCESS	4
VOIK Oluk	٠						Rework			Skid-tube	Crosstube	1	Water Jet	Engineering
Part N	١o.						Scrap			Machining	Small Fab	Pro	d. Eng. Coor.	Quality
							Use-as-is			noforming	Finishing	Rec/Stor	e/Packaging	Other
NCR N	۱o.						Work Order Update]		Large Fab	Composite	J	Supplier	J [_]
Root					Des	crip	ntion of work order update		nitial	Act	tion	Sign &		
Cause		Date	Step	Qty		C	r Non-conformance	Ch	ief Eng	Desci	ription	Date	Verification	QC Inspector
oc/Data														
uip/Tooling														
perator	_													
laterial														
etup)									·
ther								ļ						
rocess upplier														
raining														
napproved														
							F	AUL	T CATE	GORY				·
Landi	ng C	Gear					General					_		
		Bending					Bend		Grain			Ovalized	<u> </u>	Pressure/Forced
		Centre No	t Concer	ntric to	o/s		BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
		Cracks					Broken/Damaged		Inspecti	on Incomplete		Part Incorre]	Weld
		Crushed/C	Crimped				Burrs	匚	Instruct	ions Incomplete/	Unclear	Part Lost/Mi	ssing	Wrong Stock Pulled
		Cuffs					Contamination		Mainte			Part Moved		
		Heat Trea					Countersink	L	Mislabe		L	Positioned V		_
		Inspection	-	Tube			Cut Too Short		Misread	I		Power Loss/	Surge	Other
		Ripples in				<u> </u>	Drill Holes		Offset					, ,
		Torque W	aves in E	xtrusio	n		Drawing		Out of 0	Calibration				
į		Turning Se					Finish	L	Out of S	equence				
		Wave/Twi	ist in Tub	e		1	Folio		Outside	Dimensions				

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Work Ord July-13-12 1:0		7331		*873	331*						Page
Item ID:	D350-748-	-101		Accept	*N900	040	100)* s	etup Star	*N	S1*
Revision ID: Item Name:	U/R Crosstube I	nstallation, High Fwd							Stop	, *N	S2*
Start Date:	7/10/12	Start Qty: 1.00	*1*		Cust Item I	D:					
Required Date	: 9/28/12	Req'd Qty: 1.00	*1*		Customer:						
Reference:			-								
Approvals:	Process F	Plan:	Date:	Tooling:	Da	ate:		F	tun Star	1/1	R1*
	QC:		Date:	SPC (Y/N):	Da	ate:			Stop	' *N	R2*
Sequence ID/ Work Center	ID	Operation Description		Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240				0.00							10
240		Packaging								191	11/75/
Packaging		Memo		0.00						•	
Packaging		Identify and Location:	pack for shipping as per	PPP D350-748-101							,

0.00

0.00

PPP Rev:

Memo

250

250

Quality Control

QC21- Final Inspection - Work Order Release

12/11/8 A) MLJ 12-17-07

Page 7

NCR:	Yes	1	No
INCh.	162	,	INU

NCR:	Yes	/ No				WORK ORDER NON-	100	NFORM	ANCE / UPI	DATE	·		***
											QA Closed:	Date:	, •
Vork Ord	er:					DISPOSITION	,		[]	_	DEPARTMENT,		
Part I	No.			·. · · · · · · · · · · · · · · · · · ·		Rework Scrap Use-as-is	-	Į į	Skid-tube Machining noforming	Crosstube Small Fab Finishing		Water Jet d. Eng. Coor re/Packaging	Engineering Quality Other
NCR I	No.			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	Work Order Update			Large Fab	Composite		Supplier	
Root					Descri	ption of work order update		nitial	Act	tion	Sign &		
Cause		Date	Step	Qty		or Non-conformance	Ch	ief Eng	Desci	ription	Date	Verification	QC Inspector
oc/Data													
quip/Tooling													
perator												i	
laterial													
etup													
ther													
rocess													
upplier										•			
raining													
napproved													
						F	AUL	T CATE	GORY				
Landi	ng (Gear				General		_		_			
		Bending				Bend		Grain			Ovalized	1	Pressure/Forced
		Centre No	t Concer	ntric to	o/s	BOM/Route		Hardwa	re	Γ	Over/Under	tolerance	Temperature/Cure
		Cracks				Broken/Damaged		Inspecti	on Incomplete	Γ	Part Incorred	ct	Weld
		Crushed/0	Crimped.			Burrs		Instruct	ions Incomplete/	Unclear	Part Lost/Mi	ssing	Wrong Stock Pulled
		Cuffs				Contamination		Mainte			Part Moved		-
		Heat Trea	t			Countersink	Г	Mislabe	led		Positioned V	Vrong	
		Inspection	Strip in	Tube		Cut Too Short		Misread	I	F	Power Loss/		Other
		Ripples in	Bend			Drill Holes		Offset			·	-	•
		Torque W	aves in E	xtrusio	n	Drawing		Out of 0	Calibration				
		Turning Se	equence			Finish		Out of 9	Sequence				
		Wave/Twi	ist in Tub	e		Folio		Outside	Dimensions				

DQA:

Date:

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Picklist Print

July-13-12 1:09:55 PM

Work Order ID:

87331

Parent Item:

D350-748-101

Parent Item Name:

Crosstube Installation, High Fwd

Start Date: 7/10/12

Required Date: 9/28/12

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:A New Issue 06-07-05 JLM

IPP Rev:B Update qty of MS21042L5 06-09-12 KJ

VERIFY BY:DD

IPP Rev:C Rev B 07-11-15 DD

IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD

IPP Rev:E 08-06-24 revD as per dwg DD verified by:EC

IPP Rev:F 10.08.04 added QSI010

4.3 DD verf:EC

IPP REV:G ADD UNDER BEND COMMENT 12-05-28 JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
ALS4-1032-225		Purchased	No			200	Each	2,462.0000	1	_ 1	.1.6		
Insert				114	8520)	#L	13-11-	-4
				Location		Loc Qty	L	oc Code					
				FP-B		2019							
				122	290	2019							
				ST281		420							
				108	696	146							
				110	768	62							
				118	386	55							
					966	68							^
				121	269	89							
				ST282		23						2	x 777
				120	410	10							
				120	451	13							
ANGAIA Bolt		Purchased	No			220	Each	411.0000	8	m %_	233y	6	3+_
				Location		Loc Oty	<u>1</u>	oc Code			•		
_ 1				360		181							
SWS				121	185	181							
				ST360		230							
				115	108	3							
					5705	1							
				118	8838	8							
,				119	328	68							
				120	0423	150							

NCR:	/es	/ No					WORK ORDER NON-C	ON	IFORN	AANCE / UPD	ATE	-		•
			-		,							QA Closed:	Date:	
Vork Orde	er: .						DISPOSITION				_	EPARTMENT/		, – 1
Part i	•						Rework Scrap Use-as-is Work Order Update		f Therm	Skid-tube Machining noforming Large Fab	Crosstube Small Fab Finishing Composite	┥	Water Jet d. Eng. Coor. e/Packaging Supplier	Engineering Quality Other
Root					Desc		tion of work order update	ĺ	nitial	Acti		Sign &	_	
Cause		Date	Step	Qty		0	r Non-conformance	Ch	ief Eng	Descri	ption	Date	Verification	QC Inspector
oc/Data														
quip/Tooling														
perator								ļ						
laterial														
etup										1				
ther	\vdash													
rocess														
upplier	Ш				İ									
raining	Ш													
napproved								<u> </u>	T CATE	CORY		<u> </u>		
								AUL	T CATE	GORY				
Landi		l .			Г		General		ا ما		_	٦	_	7
·	Н	Bending	_		_	_	Bend		Grain		-	Ovalized		Pressure/Forced
	Щ	Centre No	ot Concer	ntric to (D/S		BOM/Route	\vdash	Hardwa		-	Over/Under		Temperature/Cure
	Ш	Cracks					Broken/Damaged	Ш		on Incomplete		Part Incorred		Weld
	Ш	Crushed/0	Crimped		-		Burrs	Ш		ions Incomplete/U	Inclear	Part Lost/Mi	ssing	Wrong Stock Pulled
	H	Cuffs			1		Contamination		Mainte		<u></u>	Part Moved		
	Ш	Heat Trea			-		Countersink		Mislabe		_	Positioned V		ا ا
	-	Inspection		Tube			Cut Too Short		Misread	1	L	Power Loss/	Surge	Other
	Щ	Ripples in			Ļ		Drill Holes		Offset					
		Torque W			ן י		Drawing		ı	Calibration				
		Turning Se	-		Ĺ		Finish		Out of S	equence		<u> </u>		
		Wave/Twi	ist in Tub	e			Folio		Outside	Dimensions				

DQA:

Date:

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Picklist Print

July-13-12 1:09:55 PM

Page 2

Work Order ID:	87331								
Parent Item:	D350-748-101						Star	t Date: 7/10/12	Required Date: 9/28/12
Parent Item Name:	Crosstube Installation	on, High Fwd					Sta	rt Qty: 1.00	Required Qty: 1.00
ADELGA)		Purchased	No		220	Each	1 363 0000	16	16
Bolt		Fulchaseu			220	20011	1,203.000		\$0 3/
~ O -				<u>Location</u>	Loc Qty		Loc Code		OL A.
SMY				ST356	1363				••
•				119017	363			<u> </u>	
				121243_	500			110	
				122151	500			-1~	1
AN5-32A		Purchased	No		220	Each	277.0000	4.4	4/00 0 7 0000
Bolt									111100773 XX
				Location	Loc Qty		Loc Code		
< /-				ST339	1 7 7				
ンペン				119862	2				
				120423	75				
				122151	100				Advantage of the Control of the Cont
				ST340	100				
				121541	100				
AN960JD10 Washer	NAS1149D0363J	Purchased	No	123248	200	Each	0.0000	1 (1)	1 Al 12-11-4
N960JD416	NAS1149D0463J	Purchased	No		220	Each	29.0000	32	32
Washer									111004851
SN				Location	Loc Qty		Loc Code		m13255
2				ST351	29				111970000
				116289	8				
				119097	21			-	
AN960JD516	NAS1149D0563J	Purchased	No		220	Each	12.0000	8-34	8 03 50C
Washer		1 41 51145 5 4							m/13335
				Location	Loc Oty		Loc Code		50/2=/1-(0
				ST338	12				05/2/
325				2612	12			-	
ンパア				2012	12				

												DQA:	Date:	
NCR:	Yes	/ No					WORK ORDER NON-C	O	NFORM	MANCE / UPI	DATE	•		
												QA Closed:	Date:	·
Nork Ord	or:						DISPOSITION				AGAINST DE	PARTMENT/	PROCESS	
WOIK OIG	ет.						Rework	ı		Skid-tube	Crosstube	1	Water Jet	Engineering
Part	No.						Scrap			Machining	Small Fab	Proc	d. Eng. Coor.	Quality
				<u>-</u>		l	Use-as-is			noforming	Finishing		e/Packaging	Other
NCR	No.					۱	Work Order Update			Large Fab	Composite	1	Supplier	
												-		
Root					Descr		tion of work order update	ı	nitial	Act		Sign &		
Cause		Date	Step	Qty		or	Non-conformance	Ch	ief Eng	Descr	iption	Date	Verification	QC Inspector
oc/Data														
quip/Tooling	\vdash													
perator														
aterial	\vdash		• [
etup	Н		:											
ther	\vdash													
rocess	\vdash													
upplier raining					:									
napproved														
парріочеа	L	<u> </u>	<u> </u>	1			F/	AUL	T CATE	GORY				<u>.l.</u>
Land	ng (Gear					General							
		Bending				٦ŧ	Bend		Grain			Ovalized		Pressure/Forced
		Centre No	t Concer	ntric to	o/s	T _E	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
		Cracks				_ [Broken/Damaged		Inspect	on Incomplete		Part Incorred	:t 🗍	Weld
		Crushed/0	Crimped.			E	Burrs		Instruct	ions Incomplete/L	Jnclear	Part Lost/Mi	ssing	Wrong Stock Pulled
		Cuffs					Contamination		Mainte	nance		Part Moved		
		Heat Trea	t				Countersink		Mislabe	led		Positioned V	/rong	_
		Inspection	n Strip in	Tube			Cut Too Short		Misread	i		Power Loss/	Surge	Other
		Ripples in	Bend			[[Drill Holes		Offset					
		Torque W	aves in E	xtrusio	n [_][Drawing		Out of 0	Calibration				
		Turning Se	equence			F	Finish		Out of	Sequence				
		Wave/Tw	ist in Tub	oe -	Γ	F	Folio		Outside	Dimensions				

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

July-13-12 1:09:56 PM

Vork Order ID:	87331						D / 7/10/10	D . ID / 0/20/12
arent Item:	D350-748-101						Date: 7/10/12	Required Date: 9/28/12
arent Item Name:	Crosstube Installation, High Fwd					Star	t Qty: 1.00	Required Qty: 1.00
2856-400 brasion Strip	Manufactured	No	86905	200	f	143.0425	1.181 1.	2431579 AD 12-11-4
			Location	Loc Qty		Loc Code	•	
			ST403	133.598				
			81875	133.598				
			ST409	9.4445				
			63735	0.6696				
			68076	0.3149				<u> </u>
			71164	8.46				
3500-1 - ddie	Manufactured	No		220	Each	51.0000	[A] []	386763 P.
SMS			Location	Loc Oty		Loc Code	•	_
J .			ST423	40				
			85421	40				
			ST425	11				_
		N T	76940	11	E.d.	222 0000		
3501-1 ushing	Manufactured	No		220	Each	232.0000	10	
- 4			Location	Loc Qty		Loc Code	•	
SM			ST051	232				<u> </u>
			67757	4				
			73391	6 206			110	
			7 <u>4866</u> 85414	16			-10	/
3502±1	Manufactured	No	33 11 1	200	Each	47.0000		2 Af 12-11-4
рроге			Location	Loc Qty		Loc Code		
			LG050	37				
			77041	37			_@_	<u> </u>
			ST051	10				
			73419	9			***************************************	
			74873	1				

											DQ	4:D	ate:	
NCR:	Yes	/ No				WORK ORDER NON-O	100	NFORM	MANCE / UPI	DATE				
											QA Close	d: D	ate:	•
Work Orde	er:					DISPOSITION				AGAINST DE	PARTMEN	T/PROCESS		
Part f	•					Rework Scrap Use-as-is		ſ	Skid-tube Machining noforming	Crosstube Small Fab Finishing	4	Water Je rod. Eng. Coor ore/Packaging		Engineering Quality Other
NCR f	No.					Work Order Update			Large Fab	Composite]	Supplie	r	
Root					Descri	ption of work order update		Initial	Act	ion	Sign &			
Cause	-	Date	Step	Qty	(or Non-conformance	Ch	nief Eng	Descr	ription	Date	Verificati	on	QC Inspector
Doc/Data												-		
Equip/Tooling														
Operator														
Material														
Setup														
Other														
Process														
Supplier														
Training														
Unapproved														
						F	AUI	T CATE	GORY					,
Landi	ng (Gear				General				·	_	,		_
		Bending				Bend		Grain			Ovalized			Pressure/Forced
		Centre No	ot Concer	ntric to	o/s	BOM/Route		Hardwa	re		Over/Und	er tolerance		Temperature/Cure
		Cracks				Broken/Damaged		Inspecti	ion Incomplete		Part Incor	rect	Г	Weld
		Crushed/	Crimped.			Burrs		Instruct	ions Incomplete/l	Jnclear	Part Lost/	Missing		Wrong Stock Pulled
		Cuffs				Contamination		Mainte	nance		Part Move	ed		-
		Heat Trea	t			Countersink		Mislabe	eled		Positione	d Wrong		
		Inspectio	n Strip in	Tube		Cut Too Short		Misread	d		Power Los	ss/Surge		Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Picklist Print

July-13-12 1:09:56 PM

Page 4

ŭly-13-12 1:09:36 								·		
Vork Order ID:	87331							Stant	Date: 7/10/12	Required Date: 9/28/12
arent Item:	D350-748-101								t Qty: 1.00	Required Qty: 1.00
arent Item Name:	Crosstube Installati	on, High Fwd							t Qty: 1.00	Required Qty: 1.00
350-748-141TRN Prosstube Turning Detai	1	Manufactured	No			110	Each	2.0000	1	D17-10-
				Location	<u>n</u>	Loc Oty		Loc Code		72-10-1
•				LG	841,59	2			(7)	
					83277	1				
					83278	1				
1S2104214 Jut		Purchased	No			220	Each	2,205.0000	24	24 m/2302/5
	B			Location	<u>n</u>	Loc Oty		Loc Code	•	
Sx	1/			ST300		2205			4	
					119075	116				_
					121011	193				4
					121444	1896				_
1S21042L5		Purchased	No			220	Each	1,066.0000	A D	1122452
2 0				Locatio	<u>n</u>	Loc Qty		Loc Code	i	O .
400				300		500				<u></u>
٠ <i>ا</i> ا					121652	500				<u> </u>
				ST300		566				
					108827	4				·
					116105	5				
					116548	43				
					119109	502				
					17651	4				<u> </u>
					2937	8		127,0000 <	7.3	
1S21920-20		Purchased	No			200	Each	127.0000	<u> </u>	2 Af 12-11-9
lamp (per MIL-DTL-8	783C)			Locatio	122518	Loc Oty		Loc Code		NV
				LG050		127				
					116799	8				
					120676	8				
					121067	2				
					121274	34				
					122254	75				

												DQA:	Dat	e:	
NCR:	Yes	/ No				WORK ORDER NON-C	100	VFORM	MANCE / UP	DATE		•		•	
											(QA Closed:	Dat	te:	
Work Orde	er:					DISPOSITION				AGAINST D	ΕP	ARTMENT/	PROCESS		
Part I	۔ .oo					Rework Scrap Use-as-is Work Order Update		t Therm	Skid-tube Machining noforming Large Fab	Crosstube Small Fab Finishing Composite			Water Jet d. Eng. Coor. e/Packaging Supplier		Engineering Quality Other
Root					Descri	ption of work order update		Initial	Ac	tion	T	Sign &			
Cause		Date	Step	Qty	C	or Non-conformance	Ch	nief Eng	Desc	cription	\perp	Date	Verification	1	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved		,	`												
							AUL	T CATE	GORY						
Landi		Bending Centre No Cracks Crushed/O Cuffs Heat Trea Inspection	Crimped t n Strip in		o/s	General Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short		Instruct Mainte Mislabe Misreac	on Incomplete ions Incomplete/ nance fled	/Unclear		Ovalized Over/Under Part Incorred Part Lost/Mi Part Moved Positioned V Power Loss/	ct ssing Vrong		Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other
	ı	Ripples in	Bend		- 1	Drill Holes	1	Offset							

Out of Calibration

Out of Sequence

Outside Dimensions

Date:

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Picklist Print

Jüly-13-12 1:09:56 PM

Page 5

Work Order ID: 87331 **Start Date:** 7/10/12 D350-748-101 Parent Item: Start Qty: 1.00 Crosstube Installation, High Fwd Parent Item Name: 200 141.0000 MS27039-1-10 No 122441 Each Purchased Screw

art Qty: 1.00 Required Date: 9/28/12 Required Qty: 1.00

0 1 12:11-04

<u>Location</u>	Loc Qty	Loc Code		For Andy
GA	100		,	,
120449	100			•
ST291	5			
120120	5			
ST308	36			•
122027	36			

												DQA:	Date:	
NCR:	Yes	/ No				WOF	RK ORDER NON-C	ON	NFORM	//ANCE / UP	DATE	÷		
		,			· · · · · · · · · · · · · · · · · · ·							QA Closed:	Date:	•
Vork Ord	or.						DISPOSITION				- AGAINST DE	PARTMENT	PROCESS	•
von Ora	٠,,						Rework			Skid-tube	Crosstube	1	Water Jet	Engineering
Part I	No.						Scrap			Machining	→ Small Fab	Pro	d. Eng. Coor.	Quality
	•						Use-as-is		Therm	oforming	Finishing	Rec/Stor	e/Packaging	Other
NCR I	۷o.					W	ork Order Update			Large Fab	Composite]	Supplier	
					`	<u> </u>		لـــ						
Root		_	_	_	ì	•	work order update	1	nitial		ction	Sign &		
Cause		Date	Step	Qty		or Non-o	conformance	Ch	ief Eng	Desc	cription	Date	Verification	QC Inspector
oc/Data							green in							
uip/Tooling							Ž							
perator														
laterial	H													
etup ther	H					•		İ						
rocess	_													
upplier	\vdash			,	*									,
raining				,	. 9	•				÷				
napproved						•								
			<u> </u>	1			F	AUL	T CATE	GORY		. 1		
Landi	ng (Gear					General							
		Bending				Bend			Grain			Ovalized		Pressure/Forced
		Centre Not Concentric to O/S			BOM/	Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure	
		Cracks		Broker	/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld		
		Crushed/0	Crimped.			Burrs			Instruct	ions Incomplete,	/Unclear	Part Lost/Mi	issing	Wrong Stock Pulled
		Cuffs			L	Contar	iṇation		Mainte	nance		Part Moved		
		Heat Trea			_	Counte			Mislabe	led ·		Positioned V		· .
		Inspection		Tube		Cut Too			Misread			Power Loss/	Surge	Other
		Ripples in			_	Drill H		\perp	Offset	•				
	L	Torque W		xtrusio	n _	Drawir	ng	$oxed{oxed}$	1	Calibration				
		Turning So	equence			Finish			Out of S	equence				

Outside Dimensions

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Wave/Twist in Tube

DART AEROSPACE LTD	Work Order:	87331
Description: Crosstube High Fwd (AS350/355)	Part Number:	D350-748-101
Inspection Dwg: D350-748-141 Rev: F		Page 1 of 1

Min

23.12

Max

23.38

Required Dimension

Height

				I .
	1/2 Span	40.77	41.03	
	Angle	75	77	
	Total Span	81.55	82.05	
	Bending Passes	7		
	Crushing		6%	7
	Twist		0.25	
-189 - 4,493 4.28	305 - 4.359 Ligh	./	95 -4.489	. 303 - 7 4.341 6.9
411	4.9%	'	4.3%	. 300 2 1
7.00			1,710	6.9
2.3	- 41.000 T	1.875"	2.34Z 2.144 2. 2.	322 76.8° 23.280

Sink A Crushii top of Bens 2 4.26 Bottom & Bens 2 6.970

Side A	Side B
Comments	
59"	

sine B crubn'
Topal Bens 2 43%
Bothon of Bens 2 6.9%

	170 200	
QC15 Inspection	MAC	
Date	16	17/10/09
	10	

Rev	Date	Change	Revised by	Approved
Α	07.02.06	New Issue	KJ/JM	
В	10.08.23	Dwg Rev updated	KJ	
С	11.11.07	Dwg Rev updated	KJ (A	
D	12.04.16	Added bending, crushing & twist dimensions	KJ 9	W

DART AEROSPACE LTD

Description: Crosstube High Fwd (AS350/355)

Inspection Dwg: D350-748-141

Rev: F

Page 1 of 1

Required Dimension	Min	Max
Height	23.12	23.38
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.55	82.05
Bending Passes	7	
Crushing		6%
Twist		0.25

23.28 75.8 41.18 41.18 40 passes Side A

Side A	Side B	
Comments		
- 0056° 1	RM 12-10-1	
	, -	1 \
		Comments

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
Α	07.02.06	New Issue	KJ/JM	
В	10.08.23	Dwg Rev updated	KJ	
С	11.11.07	Dwg Rev updates	KJ 10	
D	12.04.16	Added bending, orhing & twist dimensions	KJ 🛠	ap

Æ

D

Item	Qty -141	Part Number	Description
11	Х	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6015-125	CROSSTUBE (OR D6017-115)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6		NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC, M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:



1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6017-115

FINISHED LENGTH = 110.270±0.06

2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2 CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

PAINT OUTSIDE PER DART QSI 0054.2

TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.

UNITS: INCHES UNLESS OTHERWISE NOTED.

BREAK SHARP EDGES: 0,005 TO 0,010 MAX.

IDENTIFICATION: DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)

8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.

BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.

10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.

11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING, ACCEPTABLE TO VERIFY TENSILE STRENGTHBY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.

12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE,

CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.

- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

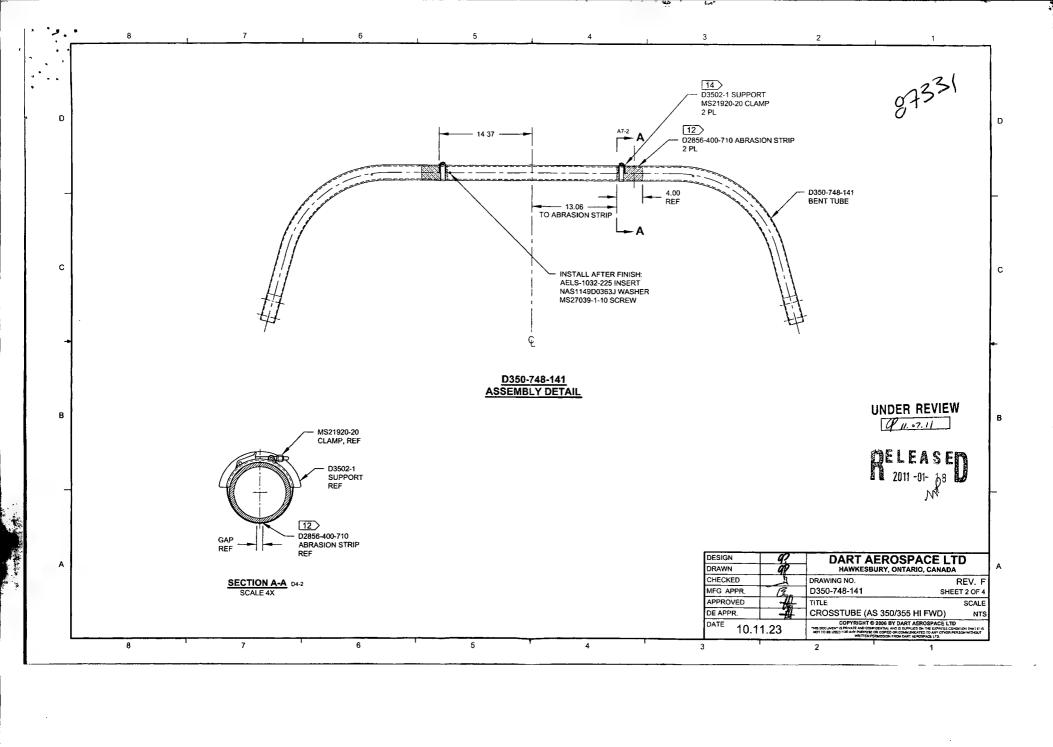
15) MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

SHOP COPY RETURN TO **ENGINEERING** UNCONTROLLED COPY SUBJECT TO AMENDMENT WITHOUT NOTICE WORK ORDER
87331 ULT 12/07/16

> **UNDER REVIEW** A 11.07.12

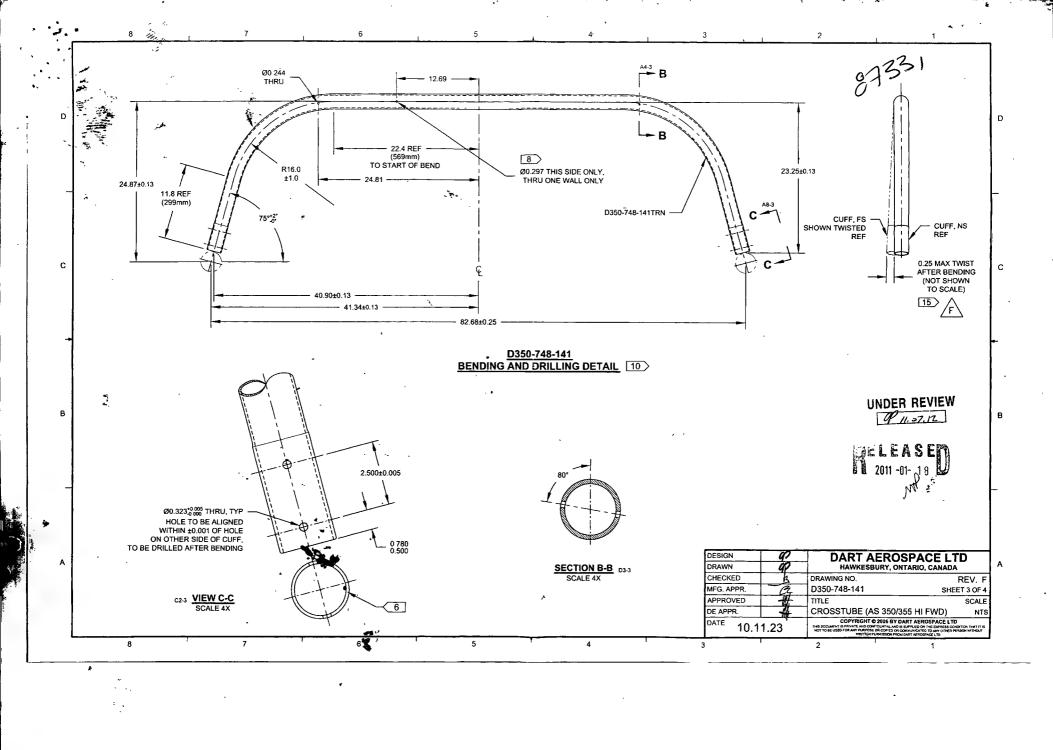
DELEASER

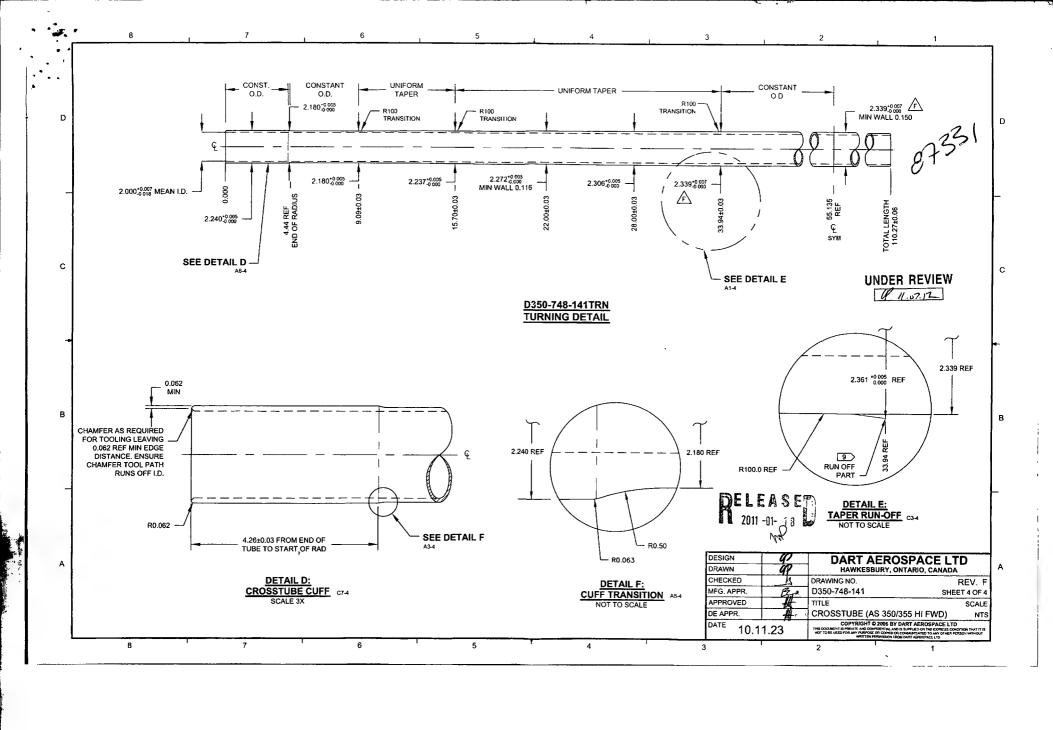
F	TWIST	RC TEST OPT LIMIT (A8-1, 0 , STOCK DIM	СР	10.11.23		
E	STANE	E GENERAL N DARDS; RELO -3); TOLERAN	RF	09.09.30		
D	MAG. F	PARTICLE AND	CAD PLATE AS MFD.	CP	06.10.31	
С	ADD C	AD PLATING	CP	06.08.14		
8	ADD D	6017-115 & PF	CP	06.06.30		
Α	NEW IS	SSUE	CP	06.03.31		
REV.			BY	DATE		
DESIGN		q)	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA			
CHECK	TIATTIC SBORT, ONTARIO, CANADA					
MFG. APPR.			D350-748-141 SHEET 1 OF			
APPROVED #			TITLE SCALE			
DE APPR.			CROSSTUBE (AS 350/355 HI FWD) NTS			
DATE 10.11.23			COPYRIGHT © 2006 BY DART AEROSPACE LTD HIS DOCUMENT G HISPACE NO COMPRESSION OF THAT IT IS HATTO BE USED FOR ANY MEMORITHM DOCUMENTS OF COMMINISTRO TO JAM OFFICE PERSON WITHOUT			



_









Certificat de Conformité
Certificate of Compliance:

BON DE TRAVAIL CHARGEMENT load

CLIENT / customer 215
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to: DART AEROSPACE 1270 ABERDEEN HAWKESBURY

ON K6A 1K7

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number	
PO18026		Steel			

SPÉCIFICATIONS DU PROCÉDÉ

processing specifications

STRESS REL

SAE AMS 2759/1 REV.E.

EXIGENCE / requirement SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results Visual

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
5	150	D350-748-101 (1) CROSSTUBE REFERENCE 87331 (1) D350-748-101 CROSSTUBE REFERENCE: 87335
		(1) D350-748-101 CROSSTUBE REF: 87339
		(1) D350-748-201 CROSSTUBE REFERENCE: 87220
		(1) D350-748-201 CROSSTUBE REFERENCE: 81522
		CONTENANT: 1 NIL

COMMENTAIRES / comments

ALL THE HEAT TREATMENT PROCESSING PERFORMED ON THIS ORDER WAS ACCOMPLISHED USING HEAT TREATMENT EQUIPEMENT THAT MEETS THE REQUIREMENTS OF AMS 2759. ALL THE HEAT TREATMENT OPERATIONS WERE ACCOMPLISHED IN ACCORDANCE WITH THE REQUESTED/REQUIRED HEAT TREATMENT SPECIFICATION AND ALL REQUIRED VERIFICATIONS TEST HAVE BEEN PERFORMED AND DOCUMENTED. NO

Page 1 of 2



Certificat de Conformité Certificate of Compliance.

BON DE TRAVAIL order	CHARGEMENT load			
179761	1			

CLIENT / customer 215 DART AEROSPACE 1270 ABERDEEN **HAWKESBURY**

ON K6A 1K7

LIVRÉ À / shipped to: **DART AEROSPACE** 1270 ABERDEEN HAWKESBURY

ON K6A 1K7

UNAUTHORIZED CHANGES OR DEVIATIONS TO REQUIRED HEAT TREATMENT SPECIFICATIONS OR PROCEDURES HAVE BEEN PERFORMED.

CERTIFIÉ par / Certified by:

DATE: 2012-10-03

* • • • • • • • • • • • • • • • • • • •			
		*	

		3	
			A Mary Carlotter

CERTIFICATE OF CONFORMANCE

CADORATH PLATING CO. LTD. 2150 LOGAN AVENUE **WINNIPEG, MANITOBA R2J-0J1**

DATE:

Oct-23-2012

CONSIGNED TO: Dart Aerospace Ltd.

1270 Aberdeen St.

Hawksbury, ON K6A 1K7

W/O #:

118420

INVOICE #:

62946

CONTRACT OR

PURCHASE ORDER #

PO18101

DESCRIPTION:

CROSSTUBE

QTY

P/N # d350-748-101

S/N # 87331

CADMIUM PLATE IAW AMS-QQ-P-416C TYPE 2 YELLOW CLASS 1. MPI IAW ASTM-E-1444. BAKE HEAT CHART # 12-1082, 12-1097.

CERTIFICATE: I certify that the items indicated here on have been inspected and tested and conform to all specifications and requirements detailed on the contract or purchase order.

Approved Inspector:



LIQUID PENETRANT TEST REPORT

ACURE	EN										
			1	0	2			1	4 -	PAGE	OF
CLIENT		Dar /	AER	STAC	£_		DATE	Nou			AM 🗹 PM 🗆
ATTENTION		YDUA	- C	HANTA			ACUREN JOB NO.	18	18-12-cc	39,	<u> </u>
ADDRESS	127	o AB	ENDE	En S	<u> </u>		PO/WO No.				
	KLALL	(E) Bu	40	<u>ر</u>			WORK LOCATION	لمرك _	ME.		
							ACCEPTANCE STD	ASTU 14	17/051-038	REV./DAT	E 2005
PROJECT	-		FF)-T	au	C	2035 To				
ITEM(S) EXAM	MINIED					1					
HEM(S) EXA						(7)					
JOB DESC	RIPTION		PROCEDUR	E No. LT-۲	MO REV	/./DATE	2008	TECHNIQUE N	NO. LT-FOUT	REV./DAT	E 2008
PART NO.		SFE	E CE	Sul7	-5		MATERIAL ACCUM	wir /	STEEL THICK	NESS _	VANOUS
SCOPE	1 .0 5-7	PLOVA	ESCE	UT D	40 7	ر کی در-	action		COMPLETE	s ou	THE
	U% EX	OTENI	V21	CAF	400						
		· 02 c/c) CAP CI	<u> </u>						
TEST DETA METHOD	AILS	FLUORE	SCENT	П	VISIBLE		WATER WASH		☐ SOLVENT REMOV	ABLE	☐ Post EmulsiFied
FAMILY BRAN	ND M		Lux		VIOIDEL		BLACK LIGHT S/N	16454	☐ OUTPUT > 1000 µ	LW/CM ²	
PENETRANT		67		OWELL TIME	4510	M IN.	LIGHTING EQUIP.	☐ FLASHLIGH	HT 🗆 TROUBLELIGHT	OUTF	PUT>100 fc @ SURFACE
PENETRANT	REMOVER	00	MINIMUM [>10	MIN.	OTHER L	ABIN	000	CAL DU	E DATE NOU (2
DEVELOPER		Salari Agus		OWELL TIME	10 □ Dr	MIN.	LIGHT METER S/N	1068	866	CAL DUE	200
DEVELOPER TEOT SUB	····	NON AQUE	308 LIA	QUEOUS	<u> </u>	(1	1				ļ.
TEST SUR		As GROUNI)	☐ As WE	LDED		MACHINED	☐ SHOT	BLASTED	2 C	CLEAN BARE METAL
	MPERATURE			□ - 4°C/	20°F TO	10°C/50°		⊿ 10°C/	50°F то 52°С/125°F	□ >	52°C/125°F
RESULTS-	- (0	METRIC	☐ IMPERIA	AL)							
ITEM		СОММЕ	NTS	_	ACCEPT	REJECT		\sim \times	\times		
1	180SS-1	RE	11)	_					\times		
	Alan								\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		
1	"	n	880	91							
1	ŭ .	7	Q 44	À7-	1	1	\~~~~	$\mathbb{X}^{X}\mathbb{X}$			$\mathbb{X}^{\mathbb{Z}^{2}}$
1	<i>u</i>	46	QUID	<u> </u>	17	1					
1-4-	11 64		BUU G	22 ·	1	 			><^><^>	<u> </u>	
12+		-	2025	1.868		 	\pm	\times			$\times_{\downarrow}\times_{\downarrow}\times$
	() ZEE	500	2055	fults)			∱ <^^>	\times	$^{\sim}$		\times
1	872					- 			\times		
1	87	33	\		/	 			><^>	< >>	
1	<u> </u>	338	_)		/	ļ		\nearrow			
								X			
Scope of Service				46	wided for in w	nitino IInde	er no circumstances shall su	uch services extend	hevond the performance of t	he requested :	services. It is expressly understoned a
											nded nor can they be construed a r and use decisions as a result of
data or other inf	formation provided by	Group Inc. is not Acuren Group Inc	assuming any re. In no event sh	esponsibilities of the all Acuren Group	ne ownerroper Inc.'s liability	in respect of	the services referred to her	rein exceed the am	ount paid for such services.	,	
Standard of Cal	ie services provided, A	curen Group Inc.	uses the degree.	care and skill ord	inarily exercis	ed under sin	nilar circumstances by other	rs performing such	services in the same or simil	ar locality. N	No other warranty, expressed or
	or intended by Acure	n Group Inc.								**-	
SIGNATUR	RES	$-A_{i}$		4-					DTD #	==	120254
CLIENT RE	PRESENTATIVE	N	PRI	NT NT			SIGNATURE		DTR#		10000
TECHNICIA	N (SIGNATURE):	///	FRI						REPORT		
		116.	PA	LIST					REVIEWED BY:	IAME	INITIALS
NAME (PR	INT):	1-410	TECH	INICIAN			2 ^{NO} TECHNICIAN		1 .	_	
		CGSB LEV		SNT LEVEL		CGSB LE		LEVEL	-		
		CGSB REG	s. No	000		CGSB R	EG. NO				